

UNIVERSITY OF CALIFORNIA, MERCED

Gentrification and Racial Change in Washington D.C: A Mixed-methods Comparison of
Neighborhood Investment and Disinvestment within Four Census Tracts

A Thesis submitted in partial satisfaction of the requirements for the degree of Master of
Arts

in

Sociology

by

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University of California, Merced 2021

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Abstract

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2021

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A nationwide real estate boom and government expansion has introduced millions of dollars of capital into previously disinvested neighborhoods in Washington, DC. Many neighborhoods have experienced both economic expansion and displacement. Gentrification does not look the same in all neighborhoods; therefore, it is important to examine the relation between both class-based and racial demographic changes of neighborhoods and their association with specific levels of investment and disinvestment. This article explores types of investment and their influence on neighborhood change within four different types of neighborhoods - Navy Yard (Tract 72), Brightwood Park (Tract 21.02), Central Avenue (Tract 99.03), and Barry Farm (Tract 74.01). I analyze two datasets - quantitative tract-level census data for these four census tracts for years 2000 through 2018 and observational qualitative data for these same four census tract neighborhood blocks, for available years of 2007-2018(9) to assess changes within them. Results suggest race and class composition of a neighborhood independently affect the levels of investment and disinvestment experienced within.

Introduction

Based on the level of economic change from 2000 to 2016, Washington, D.C was the most gentrified city in the country (Washington Dc Region). Gentrification refers to a temporal and spatial transformation process whereby neighborhoods that were once disinvested begin to experience both economic and demographic changes. This process involves reinvestment and renovation that benefits the well-off middle and upper middle-class population, typically Whites moving in and displacing low-income residents of color (Bostic and Martin 2003; Kirkland 2008; Goetz 2011; Desmond 2012; Hwang and Sampson 2014, Jackson 2015). Described as a “magnet” city by Mallach (2018), Washington D.C experienced economic changes that correspond to measures of gentrification: a remarkable influx of young higher-income residents, immensely shifting the city’s social and economic profile. Since 2000, the city has experienced an increase of upper-income households by 4,000 a year, transforming the social and economic profile of the city (Mallach 2018). Neighborhoods are rapidly changing where large parts of the city have been gentrified, and thousands of new residences and apartments are being constructed. Poorer neighborhoods, like Anacostia – incorporated in 1854 and a working-class suburb (one of the first in the District of Columbia) (Anacostia Historic District), where little demographic change has taken place and residents are largely poor and near poor are experiencing the pressure of growth that has increased housing prices. For instance, a new house was on the market for \$600,000 on an Anacostia block where the average family earns a scant \$20,000 a year (Mallach 2018).

Between 2000 and 2016, the city also experienced a demographic shift, whereby the White population in economically expanding areas increased by 44%. In declining areas, the share of the White population decreased by 22%. In contrast, 9% of the Black population resided in economically expanding areas and 35% resided in economically declined areas (American Neighborhood Change).

Before the economic boom of 2000, the 1990s national recession, followed by a federally engineered recession and a self-inflicted budgetary wound (Twenty years after the Revitalization Act, the District of Columbia is a different city) left the city of Washington D.C in despair. District residents unable to deal with the deteriorating quality of social resources, schools, and the increase of crime rates, left the city for the Maryland and Virginia suburbs. Between 1990 and 1995, a total of 53,000 residents left the District (The DC Revitalization Act: History, Provisions and Promises). In 1997, congress enacted The Revitalization Act that addressed the city’s financial instability and disinvestment and allowed for an economic transformation. The economic recovery of the 2000s has benefitted the city with a growth in its population (educated, high-skilled residents), jobs, and incomes (The Dc Revitalization Act: History, Provisions and Promises). Between 2000 and 2018, the citywide median increase in home value was 91%, the citywide median of median household income increased from \$60,276 to

\$85,750 (an increase of 29.7%) and the population over the age of 25 who had a college degree increased by 32.1% citywide ([Mapping Gentrification in Washington DC](#)). To explore both economic and physical differences between neighborhoods based on census data, we use the year 2000 as the baseline to our study.

The types of investments experienced within gentrification are measured by the proliferation of commercial uses aligned with gentrification, housing price appreciation (Freeman 2005), urban development, open space revitalization, and construction of infrastructure, public or private investment in forms of neighborhood public housing, parks, and financed rail transit (Zuk, Bierbaum, Chapple, Gorska, & Loukaitou-Sideris 2018), development of luxury high rise buildings, improvement of public amenities and public infrastructure (Hwang 2015). By focusing on specific forms of investment, researchers capture different effects on neighborhood outcomes. For example, by using certain metrics over others, 1) some neighborhoods may be “gentrifying”, whereas others may not and 2) certain neighborhoods may experience forms of investments not being explored by the researcher. Given these nuances, the process of gentrification does not look the same in all neighborhoods, therefore it is important to examine the relation between both class-based and racial demographics of neighborhoods and their association with specific levels of investment and disinvestment.

This raises the questions of: What is the relationship between public and private investment and gentrification? What is the relationship between racial change and public and private investment? I argue that public and private investment is highly associated with racial change. Tract 72 is the only neighborhood that experienced displacement of majority of its Black population, complete redevelopment, and highest levels of public and private investment. Neighborhoods that experienced low gentrification, and low racial displacement (tract 99.03) underwent comparable private disinvestment but even higher public disinvestment than a non-gentrifying neighborhood with similar racial displacement (tract 74.01).

This study relies on quantitative nationwide surveys for years 2000 and 2018 along with observational qualitative data for years 2007-2018(9) to address empirical questions of interest. By using a mixed method approach and narrowing the focus to public and private forms of investment and disinvestment, this article adds to the literature of investment and gentrification by exploring types of investment and their influence on neighborhood change. In the following section, I review literature and establish a framework for analyzing gentrification and racial change, which leads to my research question. I then describe the datasets, data collection, and data analysis strategy. The “Data Presentation/Findings” presents data outcomes organized around empirical questions. I conclude with a discussion on the significance of race in levels of investment and disinvestment experienced within gentrifying and non-gentrifying neighborhoods.

Review of Literature

Defining gentrification

Scholars either adopt Smith's (1998:198) definition of gentrification: "the process by which central urban neighborhoods that have undergone disinvestments and economic decline experience a reversal, reinvestment, and the in-migration of a relatively well-off middle- and upper middle-class population," or modify their definition to highlight specific aspects of this process within neighborhoods (Hammel and Wyly, 1996; Bostic and Martin 2003; Zukin, Trujillo, Frase, Jackson, Recuber, and Walker 2009; Smith 2014; Jackson 2015; Mallach 2018).

The process of gentrification has been explained by two sociological perspectives: one as an economic process whereby the real estate industry profits from inner cities' "young and moneyed" and replaces those who are not profitable; the other as a social process that emphasizes generations of White people who were brought up in the suburbs, that then relocate to the inner city for "personal liberation and economic possibility" (Moskowitz, 2017). Mallach (2018) argues cities only gentrify if the process is profitable for real estate developers. Gentrifiers may seek emancipation from suburban standards, art, or a sense of discovery, yet that would not be achievable if it were not for the return in profits. Alternatively, Mallach (2018) contends that while gentrification at its core may be economic, it also raises cultural, social, and political issues. He explores the complex process of gentrification by focusing on power relationships that underlie urban change. Hamnett (1991) describes both perspectives as complementary in explaining the totality of the phenomenon.

Residential segregation continues to create circumstances for gentrification to occur along racial lines. Discrimination in housing and lending markets allows for the uneven distribution of investment during the process of urban development (Charles 2003; Somashekhar 2020). Gentrification is a multi-dimensional phenomenon that does not exist separately but is rather linked to several issues in the country that preserve racial dimensions of inequality (Anderson 1992). The multiple legislative efforts of the Civil Rights Era succeeded in banning housing discrimination yet have not attenuated its effects. Racism is more than stereotypes and individual prejudice; it exists in policies and institutional practices. Racism involves past and present social policies, institutional practices, racist ideologies, and racial meanings in the US, that advantage some racial groups at the expense of others via power structures, institutions, organizations, and group relations (Feagin and Elias 2013). Different treatment and consequences based on people's race, is most significant when comparing Whites and Blacks. The process of gentrification allows the continuation of racialized investment within neighborhoods and therefore, racial inequality.

Policies that created gentrification

Prior to 1968, government agencies introduced zoning laws that redlined cities and systematically allowed banks and insurance companies to deny loans and services to Black residents. “Redlined” neighborhoods were considered to be “undesirable” for investment and restricted entire Black neighborhoods from access to public and private reinvestment that resulted in further deterioration. Redlining was banned 53 years by the Fair Housing Act, yet the lingering effects of racial discrimination are still present in patterns of economic and racial residential segregation within US cities. Racial residential segregation continues to create underclass communities and systematically produce deprivation in Black communities (Massey & Denton 1993). By making the process of purchasing a home more difficult for minorities, these social policies and practices contributed to racial disparities in homeownership and wealth accumulation that systematically undermine the social and economic well-being of minorities (Charles 2003).

Racialized investment

The antecedent foundation work by local government and the physical aftereffect of gentrification creates different forms of “othering” or racialization by redistributing resources along racial lines (Omi & Winant, 1994). The process of gentrification and displacement continues to supplement the ongoing structures of oppression that have long dislocated, subordinated people of color, and concentrated Black poverty within specific types of neighborhoods (Massey and Denton 1993; Kirkland 2008). Gentrification shifts a neighborhood’s economic value and racial/ethnic composition with the influx of new capital and investment into the community (e.g., new and or improved resources, rising housing costs, higher-end construction, and building upgrades). The pace of economic development resulting from gentrification, however, is associated with a neighborhoods racial transition and composition (Sutton 2020). More specifically, the extent of economic gains as result of gentrification can be attenuated or amplified by racial transition occurring during the process. For example, the increase of Black residents significantly depresses the pace of gentrification (Sutton 2020). Owens and Candipan (2019) explore whether socioeconomic ascent perpetuate racial inequality by investigating the relation (if one) between racial/ethnic demographic trends that accompany neighborhood socioeconomic ascent from 1990 to 2010. They find that “ascendant Black and Hispanic neighborhoods experienced an increase in the White population share from 1990 to 2010, when the national White population share was declining. Conversely, ascendant White neighborhoods were more likely to remain predominantly White than nonascendant White neighborhoods” (Owens and Candipan 2019: 1569).

Gentrification enables residents of the middle- and upper-middle neighborhoods to undertake development initiatives that will further benefit their neighborhoods with the improvement in the amenities, creation of public services, and lower crime activities

(Anderson, 1992; Mallach, 2018). The need for revitalization within newly gentrified neighborhoods has increasingly been addressed by concerned policymakers in the development agenda for urban areas. Instead, lower income families find themselves facing rent increases, evictions or other displacement pressures that leave them with no other option but to move to suburban areas, leaving behind jobs, family businesses and service providers. Family and community owned businesses are usually replaced by businesses catering to new resident needs. Commercial uses and urban features corresponding to gentrification such as neighborhood aesthetics, public, private, small, and large-scale reinvestment imply an “erudite culture and conspicuous consumption,” a desired status and cultural taste that complements the tolerance and diversity of the gentrifier (Smith 2014; Hwang and Sampson 2014; Zukin, Trujillo, Frase, Jackson, Recuber, and Walker 2009).

Racial Displacement and Its Consequences

Racial stratification is reflected in investment and disinvestment patterns during gentrification. Racialized minority composed neighborhoods can also experience gentrification, however, in comparison to their counterparts, they experience weaker trajectories or reinvestment and renewal, leaving them disadvantaged and isolated (Hwang & Sampson, 2014). Public housing demolition has been employed as economic development strategies on behalf of local governments to create livable communities that disproportionately impact public housing predominantly occupied by African Americans (Goetz 2011). Though scholars focus on displacement of residents as frequent result of gentrification, there is disagreement on whether the phenomenon is a unique component of gentrification, or the extreme of various other harms undergone by residents of gentrifying spaces (Kirkland 2008). Displacement is understood as the process "whereby current residents are forced to move because they can no longer afford to reside in gentrifying neighborhoods" (Freeman, 2005, p. 463). Consequences of displacement experienced by residents include the disruption of social networks tied to their communities, despite unsafe, crime-ridden, and physically deteriorated public housing. For residents able to remain in gentrifying neighborhoods, the feeling of marginalization, isolation, and alienation is common (Kirkland 2008).

Measuring gentrification

The process of gentrification is multifaceted in the theoretical approaches, definitions and measures that explain its causes, consequences, and benefits. Disagreement about definitions and measures of gentrification relate to the way scholars examine what drives the process of change, its benefits and who receives them. Varying theories and approaches, indicators of change and threshold for those indicators, adopted to map gentrification depend on the researcher's decision of what causes and indicators they want to highlight during the process (i.e., private investment, state-led public investment, changing consumer preferences, or rent gaps). Different methods produce different conclusions about the "location and severity of gentrification" (Preis, Janakiraman, Bob and Steil 2020).

Measuring gentrification with public and private investment

Investment and physical changes to the landscape lead to the rise in home values, median household incomes, and educational attainment of residents – quantitative and class-based changes in measures and features associated with gentrification (Hammel and Wyly, 1996; Bostic and Martin 2003; Wyly and Hammel 2004; Heidkamp and Lucas 2006; Zukin, Trujillo, Frase, Jackson, Recuber, and Walker 2009; Hwang and Sampson 2014; Smith 2014; Jackson 2015). Additionally, research has incorporated various types of quantitative data to further assess specific characteristics of gentrification (Wyly and Hammel 2004; Goetz 2011; Meltzer and Schuetz 2012; Owens and Candipan 2019; Somashekhar 2020; Sutton 2020).

Specific neighborhood characteristics such as educational attainment, owner occupancy, beautification efforts, as well as a high presence of multiunit buildings significantly predicts renovation, in contrast to the presence of public housing, and collective perceptions of physical disorder (Hwang and Sampson 2014), which negatively predicts it (Zuk, Bierbaum, Chapple, Gorska, & Loukaitou-Sideris 2018). Furthermore, the presence of these younger and more highly educated residents can also improve the physical landscape. Physical upgrades of an environment can be a result of individual actions or state sponsored investment in housing, infrastructure, services, and maintenance (Davidson and Lees 2005). Gentrifying neighborhoods experience significant social and economic reconstruction that creates and concentrates professional and technical jobs, as well as cultural markets that attract new populations (Goetz, 2011). The unequal distribution of public and private investment is a measure for the consequence of gentrification. Systemic policies and practices have made historically disinvested neighborhoods susceptible to gentrification. By this measure, gentrified neighborhoods experience investment in amenities. (Zuk, Bierbaum, Chapple, Gorska, & Loukaitou-Sideris 2018), changes in land use (Hamnett and Whitelegg 2007), and changes in the character of the neighborhood (Zukin, Trujillo, Frase, Jackson, Recuber, and Walker 2009). However, racial stratification is reflected in central city investment and disinvestment patterns during the process of gentrification.

To visually capture temporal and spatial changes within neighborhood experiencing gentrification, scholars like (Hwang and Sampson, 2014) propose a new method to measure gentrification using the free mapping service, Google Street View. Google Street View provides 360-degree interactive panoramic views of city blocks worldwide. Hwang and Sampson (2014) focus on both qualitative and quantitative changes within Chicago from 2007 to 2009 in efforts to capture visible aspects of neighborhood reinvestment, upgrading, and renewal as result of gentrification. They incorporate census data, police records, prior street-level observations, community surveys, proximity to amenities, and city budget data on capital investments to establish a more systematic approach to measuring the process of gentrification. They define a neighborhood's stage of gentrification in 3 ways: (1) the "structural mix" of an area which includes the combination of older structures, an indicator of an area's preexisting socioeconomic status, and the extent of new and rehabilitated structures (2) visible beautification efforts; and (3) lack of disorder and decay (Hwang and Sampson 2014: 732-733).

Measures of gentrification - racial change

Studies of gentrification generally discuss the phenomenon with a reference to race, however, not all measures include race and ethnicity as an indicator for gentrification (Kirkland 2008). Scholars that do include race and ethnicity as measures of gentrification vary in the extent to which racial change is explored within the study's context (Charles 2003; Goetz 2011; Hwang and Sampson 2014; Huante 2019; Somashekhar 2020). The relation between race and gentrification is commonly only focused on the Black and White binary where scholars compare Black and White gentrifiers and retail experienced within their respective neighborhoods (Somashekhar 2020), the consequences and benefits to majority Black and White neighborhoods as result of changing demographic patterns during the process of gentrification (Jackson 2015).

The pace of gentrification appears to accompany the share of Black and Latinx residents (Hwang and Sampson 2014; Sutton 2020). When middle-and upper income individuals move into predominantly racialized minority neighborhoods, instead of integrating into these racial and ethnic groups, it appears to lead to significant declines in the Black population (Jackson 2015). Attracting African American middle-class residents to previously poor Black communities, known as "Black gentrification," is considered a financial, personal investment, and form of racial uplift. However, Black gentrification blurs intra-racial class differences and underestimates the negative consequences this form of gentrification could have on lower-income residents. Therefore, Black middle-class gentrification may be no better than White gentrification because Black gentrifiers invest in communities with dense concentrations of public housing and poverty. This results in support to demolish public housing to create livable communities (Patillo, 2007). Black homeowners are also attracted to neighborhoods that display characteristics associated with gentrification (Bostic and Martin 2003). Nevertheless, commercial change is variable to the economic and demographic composition of a neighborhood

(Meltzer and Schuetz 2012). In his large-scale assessment of retail development, Somashekhar (2020) found that between 2000 and 2010, neighborhoods gentrified by Whites experienced faster retail growth aligned with gentrification than neighborhoods gentrified by Blacks. Neighborhoods gentrified by Blacks did not only experience slower commercial growth, but in some cases, even slower than neighborhoods that did not gentrify.

Qualitative and quantitative approaches

Purely quantitative or qualitative approaches provide mixed results in observing and measuring the complex process of gentrification (Brown-Saracino, 2017). Quantitative studies of gentrification only rely on census data measures that describe the characteristics of a neighborhood (i.e., increased poverty or wealth) (Brown-Saracino 2017). Qualitative approaches of gentrification capture changes in the physical landscape of a neighborhood that cannot be captured with census data, such as indicators of neighborhood reinvestment and disinvestment that can be explored with qualitative approaches (Hwang and Sampson 2014). Qualitative scholars highlight gentrification as a social problem, “fueled by powerful actors and institutions” that negatively impact longtime residents. These consequences are captured by ethnographers who focus on residents who frame gentrification as “as troubling, as threatening a way of life and community character,” (Brown-Saracino 2017). Despite varying emphasizes of the process and consequences of gentrification, from each approach, quantitative approaches complement the findings of qualitative ones (i.e., gentrifiers’ motivations for neighborhood selection) (Brown-Saracino 2017). In his book, *The Scholar Denied: W.E.B. Du Bois and the Birth of Modern Sociology*, Morris A. (2017) discusses Du Bois’ use of a mixed method approach to his foundational study of urban racial segregation and inequality, *The Philadelphia Negro* (1899). Morris describes Du Bois' method as one of "triangulation" in which quantitative and qualitative data are gathered to cross validate each other.

Eligibility

Threshold determinant of change is also important to consider when measuring gentrification. Despite same usage of data, eligibility criteria, and indicators, results may still vary from study to study because of difference in threshold of same variables. Eligibility indicators are themselves measured differently, for example, income can describe various sources – household income, family income, median income, or average income. The approach by Hammel and Wyly (1996) to determine gentrifiable versus non-gentrifiable tracts by incorporating census data has been a preferred technique. Hammel and Wyly (1996) employ a mixed method approach that combines both tract-level census data and extensive fieldwork to develop a more accurate approach that distinguishes gentrification from other types of inner-city redevelopment within U.S. neighborhoods.

They conducted house-by-house surveys to identify gentrifying tracts, developed a multivariate statistical model to select variables specific to gentrifying areas from socioeconomic, housing, and total population variables. Finally, they used decennial census data to determine which neighborhoods had median incomes below city-wide medians from 1960 and 1970. In their survey, they paid close attention to visible evidence of investment experienced by single-family homes and multi-family buildings. These included a wide range of improvements that reflected reinvestment or rehabilitation in the quality of steps, porches, windows and frames, fences, accessory structures and so forth. It also included the quality and style of painting, degree of ornamentation, porch furniture and leading entryways and signage.

Indicators of Neighborhood Change

How scholars measure and define gentrification is constantly evolving. We use the operationalization of gentrification adapted from Hammel and Wyly (1996) to identify four census tracts in Washington DC, as having been gentrified between 2000 and 2018, by employing three separate quantitative criteria of gentrification: (1) change in percent of people over 25 with college degrees is higher than the city median, (2) change in household income is greater than the city median, and (3) change in home value is greater than the city median. Because race is central to theories of gentrification, we used the percent change in the Black and White population as a measure of racial change. To be considered eligible case studies, each census tract needed to meet one of two eligibility criteria: (1) they were below the city median income in 2000; or (2) they were majority Black in 2000.

Gentrification in Washington, DC

After the 1990 economic repercussions experienced by Washington DC, a nationwide real estate boom and government expansion introduced millions of dollars of capital into previously disinvested neighborhoods. Younger, more affluent residents swarmed back into the district, “reversing the city’s five-decade population slide, replenishing its tax base and reshaping the landscape and the culture.” By 2010, the city had become younger, wealthier, whiter, and was thriving economically (Asch & Musgrove 2017). In 2000, Washington D.C., was one the fastest-gentrifying metropolitan areas and one of the most educated in the U.S (Washington: Number One In College Degrees). Of all eligible census tracts to gentrify, 51.9% had gentrified by 2000, as compared to 4.9 % in 1990. (Gentrification in America Report [Governing]).

Since 2000, neighborhoods that have experienced economic expansion have also seen displacement - decrease in individuals in poverty, decrease in their Black population, increase in their college educated population, and increase in their White

population (Washington Dc Region). During this time period, the city had experienced a 47% increase of individuals with college degrees; a median household income increase of 40% and a median housing value increase of 146%. In 2018, the Black population had declined from 60% to 47% while the White population had increased from 31% to 41% (IPUMS NHGIS, University of Minnesota, www.nhgis.org). Despite economic and racial change, not everyone equally benefitted, consequently advantaging and disadvantaging access to resources. As the district became Whiter and more affluent, income and racial divides across neighborhoods became deeper (Twenty years after the Revitalization Act, the District of Columbia is a different city). Furthermore, not all areas of the city experienced significant decline of the Black population. Certain census tracts experienced displacement of its Black residents, some remained majority Black and others majority White (Mapping Gentrification in Washington DC).

Lee, Spain, & Umberson (1985) describe the consequences of neighborhood revitalization on racial residential shifts and refer to this process as the displacement hypothesis – the prediction that as the “percentage of neighborhood residents who are Black will decline as renovation activity proceeds.” The displacement of Black residents appears to “pave the way for present-day development and gentrification,” as poor minority, low-income residents move out, White middle-and upper-income residents move in (Anderson 1992). Jackson (2015), like many gentrification studies, finds a similar association between a decrease in the Black population and the process of gentrification. As tracts gentrify and experience an in-migration of middle-and-upper income residents into predominantly racial and ethnic minorities neighborhoods, Black residents are more likely to be displaced therefore suggesting the process is not associated with an increase in racial diversity (Jackson 2015).

There is still a need to examine the process of gentrification and its impacts on different racial groups, while also considering the relationship between gentrifying neighborhood characteristics and the racial composition within Kirkland (2008). Studies regularly focus on gentrified and non-gentrified neighborhoods as case studies and overlook the need to explore the impact of gentrification within other types of neighborhoods, who are at different stages of gentrification. It is important to note that gentrification is not a ‘one-size-fits-all’ process (Preis Janakiraman, Bob, and Steil 2020). Neighborhoods do not experience the same levels of gentrification; therefore, it is essential to examine the economic and racial characteristics of distinct spatial areas and their association with the levels of reinvestment within them. This project aims to explore an overlooked perspective in neighborhood renewal and racial change - the relationship between change in a neighborhood’s population and the physical changes within those neighborhoods. The following research question guides this work: how are different levels of gentrification in Washington DC associated with levels of public/ private reinvestment/disinvestment? I hypothesize the following association – as that the racial composition of a neighborhood, more specifically, displacement of Black residents increases forms of public and private investment within (Charles 2003; Meltzer and Schuetz 2012; Somashekhar 2020). We explore how the racial composition of a neighborhood in DC affects levels (and types) of investment and disinvestment experienced within.

Methods

We explore forms of public and private reinvestment and disinvestment levels within contrasting types of neighborhoods and employ a mixed method approach to systematically describe landscape characteristics. I analyze secondary data quantitative tract-level census data for four census tracts within Washington D.C, from the free of charge IPUMS National Historical Geographic Information System (NHGIS) and primary observational qualitative data. The census tracts of interest are as follows: 72 (located in the Navy Yard), 21.02 (located in Brightwood Park), 99.03 (located in Central Avenue), and 74.01 (located in Petworth). Figure 1 below presents the geographical location of each census tract within the border of Washington, D.C. Overall, data will provide a thorough analysis of the economic, racial composition and physical differences between neighborhoods of interest based on census and observational data. We pay specific attention to four census tracts who were majority Black in 2000 were below the median income in 2000 in efforts to explore how class-based indicators of gentrification experienced within, are associated with displacement of the Black population and the types of investment and disinvestment within.

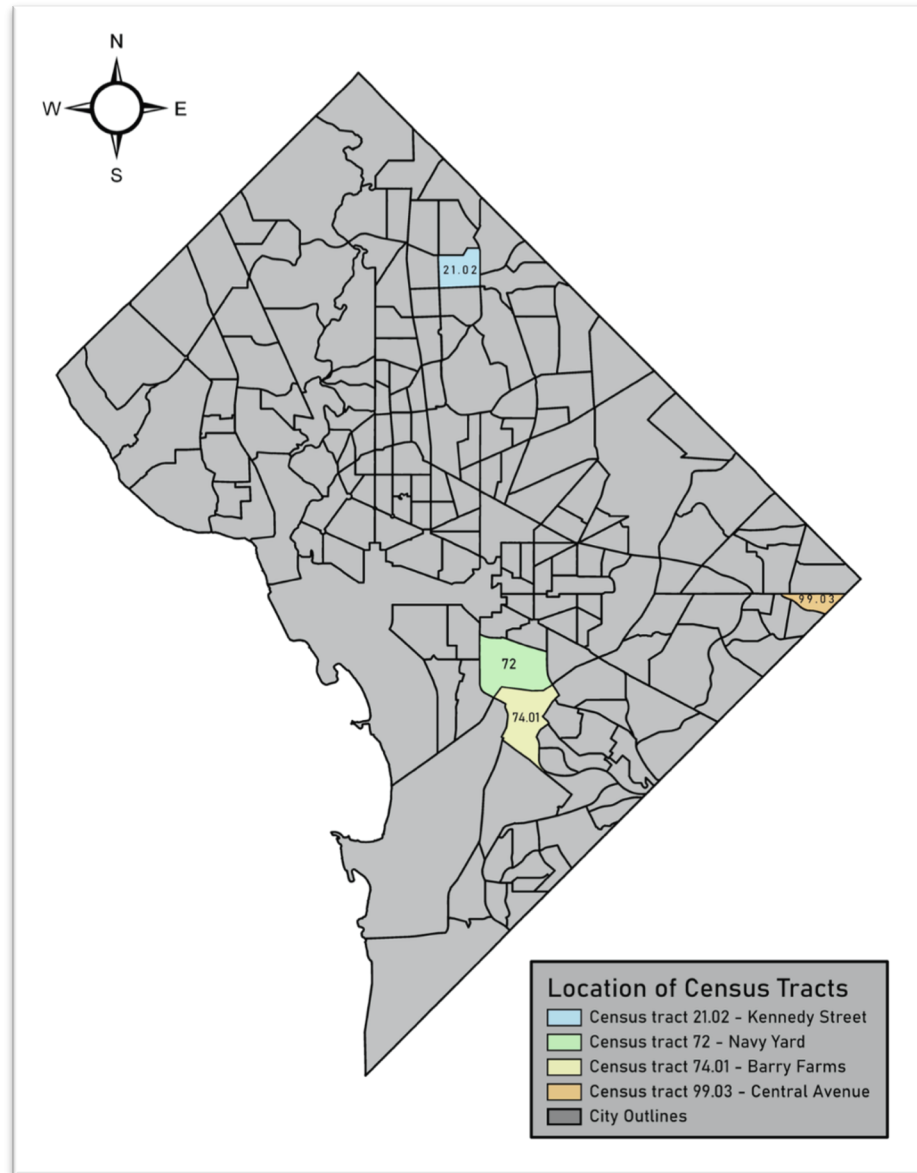


Figure 1: Map of census tract location, Washington D.C.

Quantitative based indicators

Quantitative methods were used to identify differences between neighborhoods of interest based on census data. Purposive sampling was then used to select census tract case studies of interest. The table below presents both class and racial change from 2000 to 2018 for each tract chosen to be used as our case studies, based on census data.

Census Tract	Change in class composition from 2000-2018	Change in racial composition from 2000-2018
Tract 72 – Navy Yard	<ul style="list-style-type: none"> - 1370.2% degree holder increase - 872.7% median income increase - 201% median housing value increase 	<ul style="list-style-type: none"> - Black population share decrease from 96% to 23.5% - White population share increased from 3.3% to 68%.
Tract 21.02 – Kennedy Street	<ul style="list-style-type: none"> - 156% degree holder increase - 55% median income increase - 137.7% median housing value increase 	<ul style="list-style-type: none"> - Black population share decreased from 90% to 66% - White population share increased from 2.5% to 15.8%.
Tract 99.03 – Central Avenue	<ul style="list-style-type: none"> - 180% degree holder increase - 81% median household income increase - 115% median housing value increase 	<ul style="list-style-type: none"> - Black population share decreased from 98% to 93% - White population share increased from 0.3% to 5.1%.
Tract 74.01 – Barry Farms	<ul style="list-style-type: none"> - 318.5% degree holder increase - 33.6% median household income decrease - 18% median housing value increase 	<ul style="list-style-type: none"> - Black population share decreased from 98% to 92% - White population share increased from 0.47% to 3.5%.

Table 1: Change in racial and class composition from 2000 to 2018 for each census tract

Census tracts 72, 21.02, 99.03, and 74.01, within Washington D.C were chosen for having different levels of gentrification and Black displacement based on quantitative data for years of interest 2000-2018. We classify these neighborhoods into four

typologies: (1) high intensity gentrification and displacement; (2) moderate gentrification and moderate displacement; (3) low gentrification and low displacement; (4) not gentrified and low displacement. By most quantitative measures stated above, census tract 72 is the most gentrified neighborhood in Washington DC, having experienced complete redevelopment and displacement of majority of its Black residents. In like matter, tract 21.02 is in the early stages of gentrification and has experienced a decline in the number of Black residents. By some quantitative measures, census tract 21.02, located in Brightwood Park, experienced moderate gentrification, and moderate displacement of its Black residents. Alternatively, by some quantitative measures, census tract 99.03 has experienced low levels of gentrification and low levels of Black resident displacement. In contrast, census tract 74.01 had minimal signs of redevelopment, and thus had not gentrified nor experienced high levels of Black displacement in 2018. The line chart in figure 1 visually presents and compares Black and White residential percent change within each type of census tract from 2000 to 2018. Instead of the census tract number, each tract in the line chart is labeled as their respective level of gentrification and Black residents' displacement – gentrification and displacement (tract 72), moderate gentrification and moderate displacement (21.02), low gentrification and low displacement (99.03), and non-gentrified and low displacement (74.01). Dotted lines represent the Black population and straight lines, the White population based on census tract (each seen in different colors). From 2000 to 2018, as the percent of White residents increased within these census tracts, the percent of Black residents decreased, or in other words, as White residents increased, displacement of Black residents steadily increases as well.

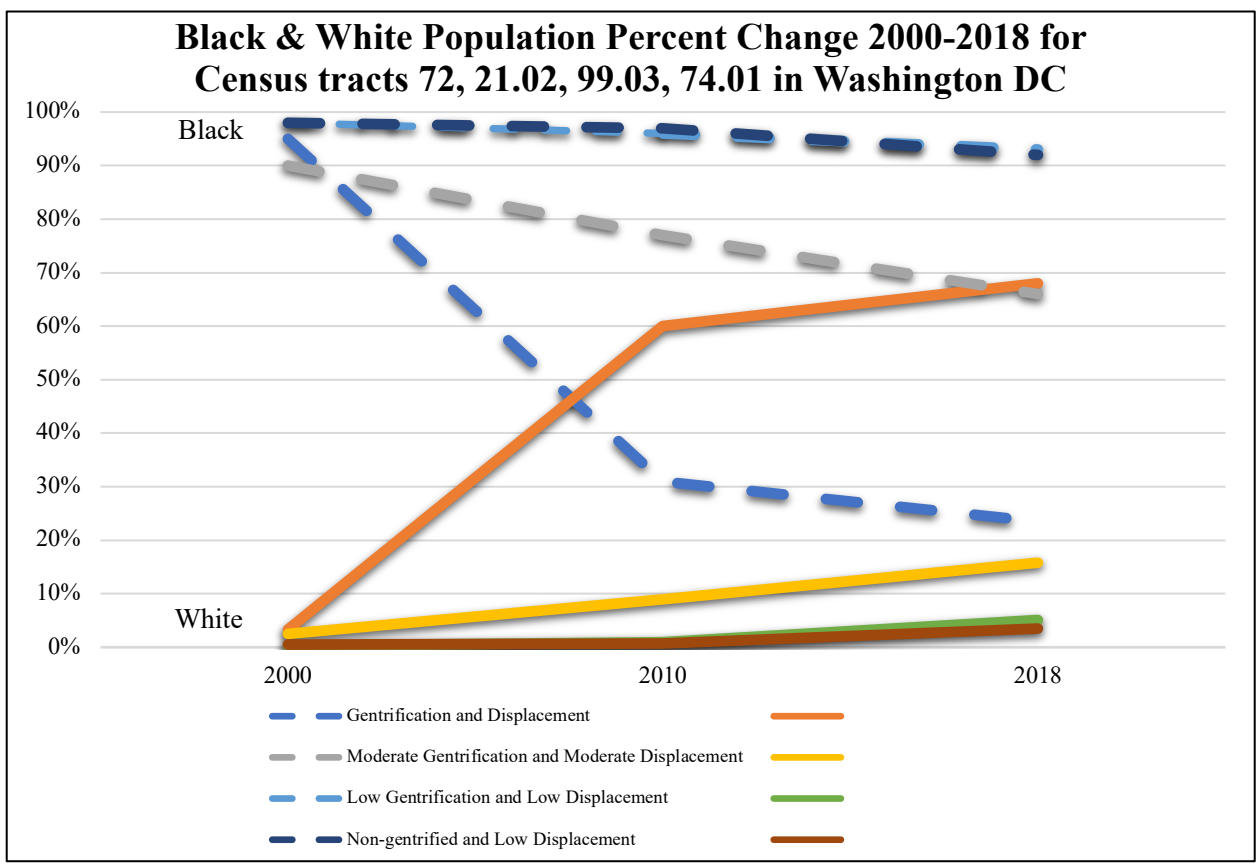


Figure 2: Census data for Black and White population within each census tract for years 2000, 2010, and 2018 from IPUMS National Historical Geographic Information System (NHGIS)

Qualitative based indicators

Qualitative methods were used to directly observe visible indicators of neighborhood change and disorder. To gain a better insight into varying levels and types of neighborhood investment and disinvestment, the built environment of each census tract was manually examined and coded for, via Google Street View (GSV) images. GSV images provided the earliest and most recent image years, 2007 being earliest and 2018 and 2019 being the most recent. Whether 2018 or 2019 was recent depended on year of observation. Also, not all block recent images were either 2018 or 2019, 15 out of the overall total of 359 had other years (i.e., 2014, 2016, & 2017). During content analysis, only the front and side (when accessible) of structures and residences were coded for. We adapted Jackelyn Hwang's (2015) Google Street View Gentrification Observations (GGO) to develop a survey of investment and disinvestment. The survey consisted of 35 codes, 15 of which were primarily focused on investment and disinvestment indicators. A total of 359 blocks, 2,894 structures, and 2,679 residences were coded for. Census tract 72 had a total of 121 blocks, 445 structures, and 3432 residences. Tract 21.02 had a total of 149 blocks, 1450 structures, 1387 residences. Tract 99.03 had a total of 59 blocks, 654 structures, 631 residences, and tract 74.01 had a total of 30 blocks, 345 structures, and

318 residences. Using the adapted survey, a group of undergraduate student researchers proceeded to code all neighborhood blocks for investment and disinvestment indicators within our gentrified and non-gentrified census tracts of interest. Student researchers coded blocks from 2018 – 2020.

To code the blocks, students had to “walk” down each block in the census tract taking notes and identifying if indicators of investment and disinvestment were either absent or present and provided descriptions of specific present measurements. To “walk” along the blocks and explore panoramic views, students used the left and right arrows on the bottom of the Google Street View screen and clicked on the “+” and “—” buttons on the lower right-hand of the screen to zoom in and out. Indicators of investment included new sign/traffic structures, new public courtesies, signs discouraging disorder, vacant area and public street beautification, new patio furniture or landscaping, new large-scale development, residences with minor upgrades and major upgrades as well as commercial uses that align with cultural aspects of gentrification. Indicators of disinvestment included litter, unkempt public street frontage, abandoned structures, structures with minor and major exterior decay, structures with metal gates/fences. Please refer to Figure 1 in the Appendix for an overview of all other codes used for this project. To avoid inconsistencies and errors in the data collection, we established standards for all undergraduate coders to adhere to. Students had to make sure they read and understood Hwang’s (2015) Supplementary Material before they began coding as well as attend weekly meetings where I presented how to code a block based on Hwang’s (2015) guidelines. Having all qualitative data collected for all four census tracts, I conducted an in-depth analysis of all four census tract neighborhood blocks, the structures, residences, and infrastructure quality within them. Before analysis, data was cleaned and was checked for missing, incorrect, incomplete, and duplicated data.

Data analysis

In this project, public and private neighborhood physical upgrades are measured as result of individual and state actions to improve the quality and presentation of services, infrastructure, housing, and maintenance of the environment. Public investment and disinvestment involve the distribution or lack of local government funds for the implementation or upkeep of social services, public transport, education, social housing, roads, infrastructure, etc. It also includes individual actions from the public and their choices to maintain a certain quality of public space. Public investment can also influence the location of private investment. Private investment and disinvestment involve the efforts or lack thereof money invested by other investors other than by government (e.g., companies, financial organizations). Like public investment and disinvestment, private investment and disinvestment is a result of individual actions to maintain the upkeep of residences, non-residential structures, streets, and sidewalks.

Investment and disinvestment indicators were categorized into four categories: public investment, public disinvestment, private investment, and private disinvestment. *Public investment* included the presence of new or updated: signs/structures controlling

traffic (e.g., speed, pedestrian crossing, bike lanes, parking), new public courtesies (e.g., streetlamps, bike racks, public trash cans, bus stops, street furniture, public seating), signs discouraging disorder (e.g., anti-littering/loitering/drug use/vandalism/graffiti, neighborhood watch). *Public disinvestment* included presence of litter (e.g., light garbage and other waste products such as plastic bags, cans, food wrappers, bottles, paper, or broken glass), and lack of reinvestment in the aesthetic of a neighborhood through the absence of basic grass maintenance, landscape or gardening work, yard furniture, planters, accessories in public space, as well as ground maintenance. *Private investment* included the presence vacant area and public street beautification (e.g., well-kept landscaping/gardening work, street furniture, planters, and accessories beyond basic grass maintenance, ground maintenance), new patio furniture or landscaping (e.g., well-kept landscape or gardening work, extra effort in patio or yard furniture, planters, and accessories beyond basic grass maintenance), new large-scale development (e.g., new construction in forms of luxury condos, large residential/commercial area development, converted industrial use), residences with minor upgrades (e.g., new coat of paint, update of roof, porch, windows, shutters, doors, or removal of features to modernize exterior of residence), residences with major upgrades (e.g., an added story, an enlarged patio space, or new architectural changes). *Private disinvestment* included the presence of abandoned structures (e.g., structures have the presence of burnt-out windows and doors, or boards on the windows and doors), structures with minor exterior decay (e.g., slight deterioration, decay, or damage), structures with major exterior decay (e.g., severe lack of maintenance and upkeep), and structures with metal gates/fences around majority of their perimeter or window gates. Finally, commercial uses that align with cultural aspects of gentrification can be a result of investment from local governments or private investors to locate, expand, or keep modern hip/trendy commercial buildings within a specific space.

Figure 3 presents a bar chart with multiple panels for both public and private investment and disinvestment indicators. Separated into the investment categories and levels of gentrification and displacement mentioned above, the bar chart compares types of investment and disinvestment within each census tract. Public investment, public disinvestment and commercial used aligned with cultural aspects of gentrification were observed for only neighborhood blocks. Private investment was observed throughout both blocks and residential structures. Private disinvestment was observed throughout other non-residential structures.

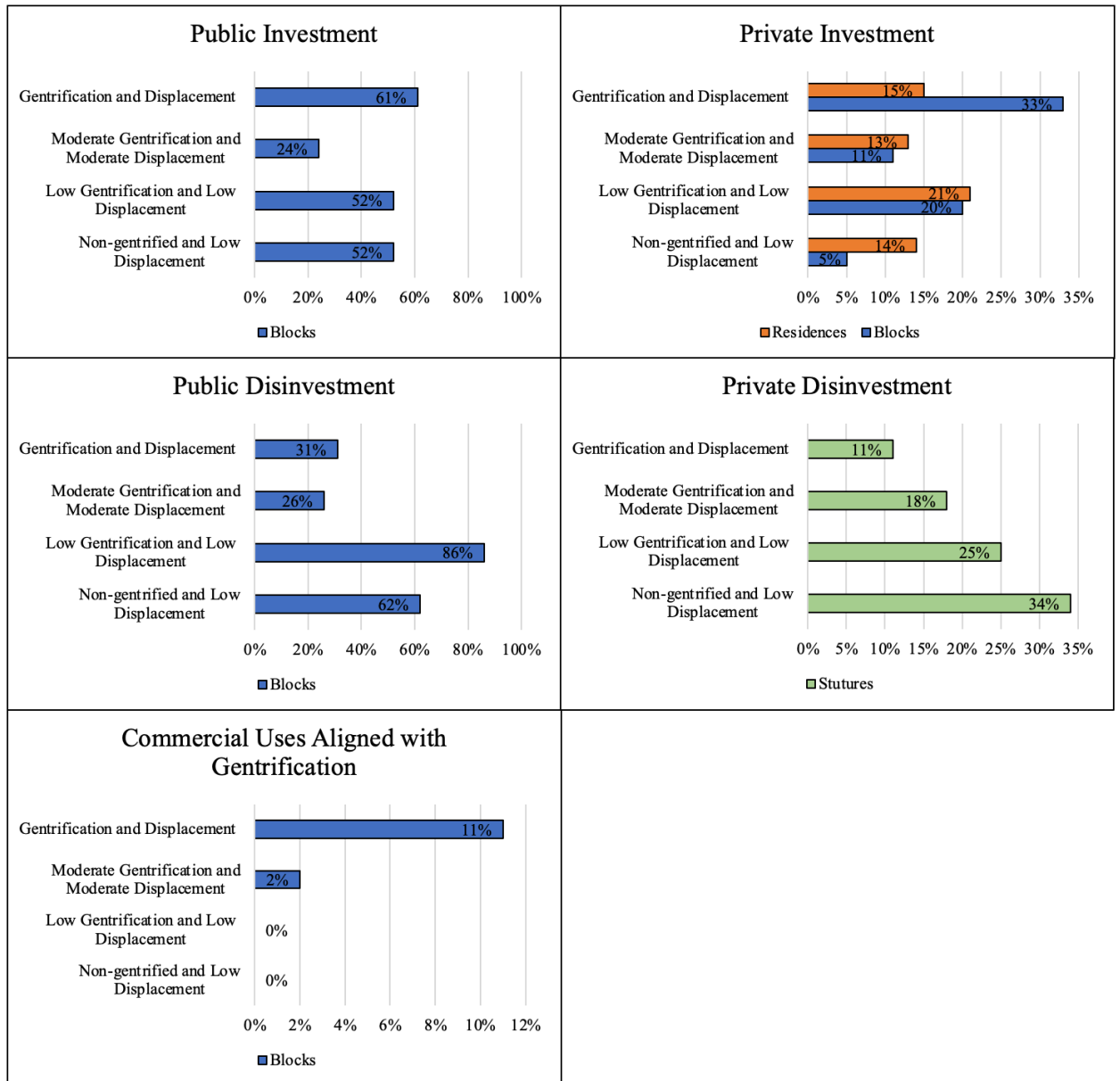


Figure 3: Bar chart with multiple panels presenting various levels of investment and disinvestment within each census tract

Results

Racial dimensions of gentrification continue to preserve “racist, segregating systems that have formed our residential landscape” (Kirkland 2008: 18). Our sample indicates varying levels of gentrification, measured by change in individuals with college degrees, median household income increase, a median housing value increase as well as racial composition of a neighborhood in Washington DC from 2000-2018, independently affects levels of investment and disinvestment.

Tract 72 experienced significant gentrification and a drastic decline of 75% of its Black population, and therefore had the highest levels of public and private investment, including commercial uses aligned with gentrification, and the lowest levels of private disinvestment.

- 61% of all blocks underwent public investment
- 31% of all blocks experienced public disinvestment
- 33% of all blocks and 15% of all residences experienced private investment
- 11% of all structures experienced private disinvestment
- 11% of blocks had commercial uses aligned with cultural aspects of gentrification

Tract 21.02 being in the early stages of gentrification and having experienced a 25.5% decline in percent of Black residents, had the lowest levels of public investment and disinvestment, medium low levels of private investment and disinvestment, and medium low levels of commercial uses aligned with gentrification

- 24% of all blocks underwent public investment
- 26% of all blocks underwent public disinvestment
- 11% of all blocks and 13% of all residences experienced private investment
- 18% of all structures experienced private disinvestment
- 2% of blocks had commercial uses aligned with cultural aspects of gentrification

Tract 99.03 having experienced some indicators of gentrification and having experienced 5.7% displacement of its Black residents, similar levels of public investment as 74.01, moderate levels of private investment, highest levels of public disinvestment, moderate levels of private disinvestment, no levels of commercial uses aligned with gentrification (like 74.01).

- 52% of all blocks underwent public investment
- 86% of all blocks underwent public disinvestment
- 20% of all blocks and 21% of all residences experienced private investment
- 25% of all structures experienced private disinvestment
- 0% of blocks had commercial uses aligned with cultural aspects of gentrification

Tract 74.01 having experienced minimal signs of development and thus had not experienced gentrification nor experienced high levels of Black displacement (6% decline) in 2018, had the highest levels of private disinvestment, similar levels of public investment as 99.03, lowest levels of private investment, and no commercial uses aligned with gentrification.

- 52% of all blocks underwent public investment
- 62% of all blocks underwent public disinvestment
- 5% of all blocks and 14% of all residences experienced private investment
- 34% of all structures experienced private disinvestment
- 0% of blocks had commercial uses aligned with cultural aspects of gentrification

With economic growth, once previously run-down neighborhoods also experience physical transformation in forms of higher end construction, building upgrades, and street infrastructure. Taking a stroll along Navy Yard, census tract 72 is the most visibly gentrified than tracts 21.02, 99.03, and 74.01. Tract 72 has been completely cleaned and gentrified. What was once an area primarily occupied by “a public housing project, a few single-family homes, abandoned and boarded-up homes, warehouses, carry out restaurants, auto shops, and large nightclubs”, and had poorly kept street infrastructure ([Census Tract 72 | Navy Yard | Washington, DC](#)), by 2018, had new developments, residence and structure upgrades, new sidewalk signage controlling traffic and discouraging disorder, new landscaping, new public street and sidewalk beautification in the form of clean, newly constructed or freshly painted sidewalks. There has also been change in neighborhood stores, with an increase of cafes, upscale suites, trendy restaurants & bars (e.g., Shake Shack, CAVA, CIRCA at Navy Yard), financial centers, etc.

Tract 21.02 with a history of racially restrictive covenants during the first half of the twentieth century and once primarily a middle- and working- class Black neighborhood, by 2018, was in the early stages of gentrification ([Census Tract 21.02 | Kennedy Street | Washington, DC](#)). Tract 21.02’s public street and sidewalks experienced little or no litter and lacked unkempt public street frontage. 18% of the structures in this tract experienced the presence of abandoned structures, structures with minor and major exterior decay, and metal gates/fences on structure windows or around their perimeter. Residences have experienced upgrades in patio furniture, landscaping, minor and major structural upgrades and vacant areas and public streets have been beautified. New large-scale construction and commercial uses of gentrification like coffee shops, trendy restaurants (e.g., Library Tavern), and event venues (e.g., Vintage Glam Tea Party & Co.).

By 2018, Tract 99.03, a neighborhood occupied with neglected public housing projects and high crime rates, had demolished and replaced East Capitol dwellings and adjacent properties with mixed-income housing ([Story Map Census Tract 99.03 | Central Avenue | Washington, DC](#)). Compared to the three other census tracts, tract 99.03

experienced the highest percent of public disinvestment, 86% of blocks had a presence of unkempt public street frontage and litter. There was 52% of blocks with sidewalk beautification such as new signs or structures controlling traffic, new public courtesies as well as signs discouraging disorder. Tract 99.03 had the second highest percentage of private investment – 21% of residences underwent beautification of landscape and patio furniture that were intentionally decorative, both minor and major upgrades in the form of slight exterior renovation such as a new coat of paint or removal of features to modernize exterior of residence and substantial rehabilitation or renovation of residence such as an added story, an enlarged patio space, or new architectural changes. 20% of blocks had the presence of well-kept landscaping/ground maintenance, street furniture and accessories beyond basic grass maintenance, as well as large scale construction (e.g., luxury condos, large residential/commercial area development). 25% of structures were either uninhabited, had the presence of burnt-out windows and doors, or boards on the windows and doors, slight deterioration, decay, or damage (e.g., faded and or peeling paint), severe lack of maintenance and upkeep of properties (e.g., obvious necessary repairs) as well as metal gates around their perimeter or on their windows.

Tract 74.01 is fundamentally opposite of tract 72 in terms of economic growth, proportion of Black residents, and visual measures of public and private investment. In 2018, still having been a majority Black neighborhood with minimal signs of redevelopment, this tract has the lowest percentage of neat and presentable outdoor areas (e.g., lack of well-kept landscaping, street furniture, planters, and accessories), residences with new intentional decorative landscaping/furniture enhancements, new large-scale developments, and residences with both minor and major physical upgrades. Structures within had the highest percentage for lack of maintenance and upkeep of properties. This included: burnt-out windows and doors, boards on windows and doors, slight and significant visible aspects of decay such as deteriorated brick, structure siding, or discolored siding or brick, and window or perimeter metal gates/ fences. Like tract 99.03, there was no presence nor increase of neighborhood stores such as coffee shops, upscale hotels, trendy higher priced restaurants/bars – businesses for the entertainment of higher income residents.

These results appear to suggest that gentrification and racial change look similar, both exhibit an upward trend over the period of study - as levels of gentrification increase, so do (1) the levels of displacement among the Black population and (2) the levels of public and private reinvestment. The racial/ethnic hierarchy of neighborhood investment perpetuated by socioeconomic ascent (Owens and Candipan 2019) is present in the significant differences between tracts 72 and 74.01 - Tracts 72 (most gentrified) compared to 74.01 (non-gentrified) experienced the largest decline of its Black population (from 96% to 23.5%) and the most public and private investment. Tract 74.01 experienced a small decline in its Black residents (from 98% to 92%) and the most private disinvestment and least private investment. It was expected of tract 21.02 (being in the early stages of gentrification and decrease from 90% to 66% of Black population) to experience more investment and less disinvestment than tracts 99.03 and 74.01. However, this was not the case, tract 21.02 experienced the least amount of both public investment and disinvestment. Tract 99.03, having undergone low levels of gentrification

and similar loss of Black residents (from 98% to 93%) as Tract 74.01 (98% to 92%), experienced equivalent levels of public investment (52%) and commercial uses aligned with cultural aspects of gentrification (0%).

Neighborhoods that experience an increase in economic-based indicators of gentrification exhibit the same upward demographic shift in displacement of the Black population and increase of investment. Race and ethnicity are salient determinants of investment patterns. As the percentage of Black and Hispanic residents increases, commercial investment tends to decline (Immergluck 1999). Displacement of Black residents increases forms of public and private investment experienced within neighborhoods experiencing demographic change. These results complement literature focused on the relation between race and gentrification whereby racism influences the consequences and benefits of the process that are experienced by majority Black and White neighborhoods (Jackson 2015). As gentrification accompanies the share of Black and Latinx residents (Sutton 2020) and a decline of the Black population as middle-and upper income individuals move into minority neighborhoods (Jackson 2015), the process appears to perpetuate racial inequality. In summary, higher levels of gentrification are associated with more private investment, commercial uses aligned with cultural aspects, and less private disinvestment. Although there is no association between gentrification and new public investment, gentrifying neighborhoods are subject to less public disinvestment. High public disinvestment suffered in tract 99.03 suggest that disinvestment is particularly racialized and public policy is at best doing little to prevent or reverse racial disparities. It appears that types of investment resulting from gentrification do not involve passivity in public policy. Rather, it involves the maintenance of public investment in gentrifying neighborhoods alongside the withdrawal of public investment in less and non-gentrified neighborhoods.

Discussion and Conclusion

The process of gentrification continues to perpetuate unequal distribution of neighborhood investment as result of a racist social system that legally segregates and disadvantages Black people in almost all areas of life. Race and racial segregation are fundamental issues to the origin of the urban underclass and status of Black Americans. Race and racial segregation are fundamental issues to the origin of the urban underclass and status of Black Americans. Wyly and Hammel (2004) contend that gentrification is associated with augmented racial discrimination whereby neighborhood reinvestment landscapes were shaped by class segregation and exclusion in the 1990s that may have resulted from racial and ethnic discrimination in forms of exclusionary housing-market practices, subtle and unintended forms of discrimination, portfolio risk considerations, and insurance discrimination. The impact of gentrification has over the period exacerbated racial problems that lead to exclusionary practices of segregation.

The in-migration of higher socioeconomic status households and their monetary and material resources, into disinvested neighborhoods directly and indirectly alters the culture and composition of a neighborhood. As result, gentrification has economic and

societal repercussions for less affluent communities. Gentrification is characterized by changes in demographics, real estate markets, land use, culture and character of the neighborhood that results in the manifestation of exclusionary practices and extended biases towards people of color. The consequences, timing, and attenuation of gentrification vary between neighborhoods and the populations within them. Therefore, it is important to continue examining the presence and effects of gentrification in various types of neighborhoods considered to be gentrified. With more data from different cities undergoing gentrification at different rates, we can arrive at definitions and similarities that can generalize the process and effects of gentrification. Our sample presents that difference in levels of gentrification and racial demographics are associated to varying levels of investment and disinvestment.

However, what is evident is the significance of race in levels of investment and disinvestment. Racial change has an independent relationship with disinvestment on top of experiencing changes in class composition of a neighborhood. The most gentrified and non-gentrified of our samples experienced and confirmed trends observed within literature where neighborhoods that are gentrified by Whites (and predominantly White) experience faster and greater lengths of reinvestment in terms of new and rehabilitated construction and infrastructure, as well as diverse retail development, in contrast to Black gentrified or non-gentrified counterparts who experience less diverse retail composition and poorer quality services (Hwang, 2015). On the other hand, tract 21.02, having experienced moderate gentrification and displacement, experienced much less public and private disinvestment than both 99.03 and 74.01, and much less public and private disinvestment than 72. 99.03, despite having experienced low levels of gentrification only experienced low levels of Black displacement, therefore experiencing the similar levels of public investment (52%) and commercial uses (0%) as tract 74.01. When comparing both 99.03 and 74.01 because of their similar levels of displacement (99.03 having experienced a 5.7% decline of its Black population while 74.01 experienced a 6.01% decline). Having a .3 percent difference in displacement and higher levels of economic-based indicators of gentrification, 99.03 had higher levels of private investment, and public disinvestment as well as lower levels of private disinvestment. As Massey and Denton also pointed out in their 1993 *American Apartheid*, Black and White levels of segregation do not significantly vary by social class, but rather is a result of White prejudice. These findings imply that the process of gentrification and displacement continue to supplement ongoing structures of oppression that have long dislocated and subjugated people of color (Kirkland 2008). Lewis, Emerson, and Klineberg (2011) find that even when removing common proxy factors related to social class, Whites still expressed a preference towards neighborhoods composed of low percentages of Black and Hispanics, revealing a negative out-group preference. Race appears to be a much more significant factor than class-based indicators of gentrification in determining how levels of gentrification are associated to levels of investment and disinvestment, therefore we should include a race-based parameter in our definition and measure of gentrification to better understand neighborhood changes.

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Appendix

<i>Content Analysis Code Sheet</i>	6. Image year:	12. Number of old residences w minor upgrades:	18. Number of abandoned/ boarded up structures:	24. Litter:	30. Are there Visible people?
1. Observer:	7. Primary land use:	13. Number of old residences w major upgrades:	19. New signs/ structures controlling traffic:	25. Unkempt vacant area or public street frontage:	31. Describe visible people:
2. Google or IRL:	8. Number of structures:	14. Number of residences with new patio furniture or landscaping :	20. New public courtesies:	26. Commercial uses aligned with cultural aspects of gentrification :	32. Distinct inconsistencies among G.S.V images?
3. Block Face Direction :	9. Number of residential structures:	15. Number of Structures with metal gates or fences:	21. New large-scale development	27. Describe commercial uses:	33. Years available for block face?
4. Street address:	10. Number of multi-family structures:	16. Number of structures with minor exterior decay:	22. Signs discouraging disorder:	28. Indicator of foreign presence:	34. Major difference b/w previous image yrs. and the most recent yr.?
5. Image month:	11. Number of structures considered old:	17. Number of structures with major exterior decay:	23. Vacant area and public street beautification :	29. Describe indicators of foreign presence:	35. If yes, briefly Describe difference b/w image yrs.

Figure 1. This code sheet was adapted from Jackelyn Hwang. 2015. "Google Street View Gentrification Observations Supplementary Material."